It is call'd Infuſion, when the *Menſtruum* is either Water, Ale, or Wine; but a Tincture, when Brandy is employ'd;) and the beſt way to obtain the uſeful Particles of volatile, tenuious, or ſubtile Subſtances, is by Diſtillation. Theſe may indeed be proper Ingredients for an Infuſion or Tincture. But there are a great many fix'd Subſtances as improper for Diſtillation as the Volatile are improper for Extracts. Thus I have thought fit to ſhew the means of finding out the Virtues of Plants without diſſolving their Texture: But if any has a mind rather to do it by the Chymical Analyſis, this is not to diſſuade them.

X. *An Account of a Book, Entituled,* Geometria Organica, ſive Deſcriptio Linearum Curvarum Univerſalis. *Auctore* Colino Mac Laurin, *Matheſeos in Collegio Novo* Abredonenſi *Profeſſore, &* R. S. S.

THE Deſign of this Treatiſe, is to examine the various Methods propoſed by Mathematicians, for deſcribing Geometric Curves; and at the ſame time to demonſtrate a new one, infinitely more General than any hitherto publiſhed; built on thoſe Theorems propoſed by our Illuſtrious Preſident, at the end of his Enumeration of the Lines of the Third Order.

The great Improvements that have been made by moſt of the other Modern Geometricians, have related chiefly to the Lines of the Infinite Order; they have been ſo fond of applying their new Methods to Mechanic and Exponential Curves, (which undoubtedly ought to give

give place to thoſe that are more ſtrictly Geometrical) that they have neglected to cultivate Geometry after the moſt regular manner. The Writers on theſe Subjects commonly riſe at once, from conſidering the Lines of the Second Order, or Conic Sections, to thoſe of the Infinite Order, overlooking all the intermediate Ranks. And hence it was, that all the Orders of Geometric Curves lay unregarded, without the known Limits of Geometry, beſides the firſt two, and a few of the ſuperior Curves that had been conſidered with ſome particular Views, till that great Author, by enumerating the Lines of the Third Order, enlarged the Bounds of Geometry, and enriched it with almoſt Seventy new Curves. Their Properties which he has given, and the manner of deſcribing thoſe of them that have a *Punctum Duplex*, have almoſt brought them on a Level with the Lines of the Second Order; which alone had long uſurped the Place in Geometry.

After this great Example, 'tis attempted in this Treatiſe, to give an univerſal Deſcription of all Geometric Lines of the Third, or any Order whatſoever. But becauſe the higher Kinds cannot be deſcribed but by means of the inferior Sorts, ſome of theſe muſt be poſtulated to deſcribe thoſe: And becauſe ſtreight Lines are the ſimpleſt and moſt eaſily deſcribed, and are always the ſame, that is, of one Sort, therefore it was thought proper to inveſtigate of what uſe they alone might be, for deſcribing Lines of all the higher Orders, in the Firſt Part of this Treatiſe; an Abſtract of which has been publiſhed in the Tranſactions for *January* and *February* laſt. I ſhall only add, that beſides the Method of deſcribing the Curves, the Manner of determining their Aſymptotes and Species is alſo demonſtrated; and the more ſimple Curves of every Order, are particularly conſidered as Examples of the Method. In the Firſt Section the Lines of the Second Order are conſidered; in the Second, thoſe of the Third Order, that have a *Punctum duplex*; in the 3d Section, the Lines of the Fourth Order, and thoſe of the Third Order that have no *Punctum duplex.* In the laſt Section there are many various Methods of deſcribing the Lines of any Order.

In the Second Part, the Curves of the inferior Orders are made uſe of for deſcribing thoſe of the higher kinds. In the Firſt Section, the Theorems publiſhed by Sir *Iſaac Newton* at the end of the Enumeration of the Lines of the Third Order are demonſtrated. In the Second Section, Curves are ſubſtituted in the room of ſtreight Lines, in all the Propoſitions of the Firſt Part. From one of theſe Propoſitions, Lines of the 1024th Order may be deſcribed by making Angles move on ſeven Conick Sections; and by three Conick Sections more, Lines may be deſcribed above the 11,000th Order. Laſtly, theſe Theorems are applied to ſhew how the more Complex of the Infinite Order, may be deſcribed from the more Simple.

In the Third Section, ſome other Methods of deſcribing Curves are conſidered, that are not ſo general as the preceding, but give ſometimes more ſimple Methods of deſcribing ſome few Lines of the Superior Orders. Particularly the *Epicycloids* deſcribed by the Motion of any Curve, whether Geometric or not, upon another equal to it are eaſily conſtructed, and ſeveral Infinite Series of them rectified or meaſured by Arches of more ſimple Curves. In this Section, ſeveral other Deſcriptions of Curves are treated of, that have been propoſed by others. In the laſt Section, to ſhew the uſe of Curves in Natural Philoſophy, two of the moſt eminent Problems in Mathematical Philoſophy are ſolved

ved. In the firſt, the Centripetal Force, by which a Body deſcribes any Curve, is inveſtigated after an eaſy manner; and a ſimple Conſtruction of all thoſe Curves that a body would deſcribe, if projected with the velocity it might acquire by falling from an infinite Height, in any Hypotheſis of Gravity, is demonſtrated. In the Second, 'tis found, that if any body deſcribe a Curve in a reſiſting Medium, the Reſiſtance is always as the Moment or Fluxion of a Quantity, that expreſſes the *ratio* of the Centripetal Force, to that Force by which it would deſcribe the Curve *in Vacuo*, multiplied by the Fluxion of the Curve. 'Tis alſo demonſtrated, that if a body deſcribe any Curve in a reſiſting *Medium*, which *in Vacuo* could have been deſcribed by a Centripetal Force, proportional to any power of the Diſtance, the Denſity of that *Medium* will be reciprocally as the Part of the Tangent intercepted between the Point of Contact, and a Line perpendicular to the *Radius* at the Center of the Forces. This Theorem is applied to ſeveral Curves; and then the 10th *Prop.* of the Second Book of the Principles, and all its Examples, are demonſtrated from it. Theſe Propoſitions are treated of here, not only becauſe they ſhew the uſe of Curves in Philoſophy, but becauſe more ſimple *Ideas* of the Deſcriptions of ſome Curves may be drawn from them, than from any other Method; and becauſe this is the Method, by which Nature herſelf deſcribes Curve Lines.

The whole is concluded by an attempt to draw a Line of any given Order, through any given Number of Points, that is ſufficient to determine the Curve. Thus if a Curve of the Order 2 *m* is to be deſcribed through as many Points, as determine a Line of the Order *m*, and three more Points, each of which are Nodes, formed by the concourſe of as many Arches of the Curve, as there are Unites in *m*, then the

Curve is determined, and a Method how to deſcribe it is demonſtrated. This, and ſome other Theorems relating to the Number of Points that determine Curves, and the manner of deſcribing them thro' theſe Points, conclude this Part.

This Book is Printed for William *and* John Innys, *at the Weſt End of St.* Paul'*s Church Yard.*

ERRATUM.

P. 14. *l.* 5. For *Calf* read *Cat.*

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